ABSTRACT OF THE DISCLOSURE

IMPROVED SPIN VALVE MAGNETIC PROPERTIES WITH OXYGEN-RICH NiO UNDERLAYER

for

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In a spin valve, an underlayer is made of oxygen-rich nickel oxide to enhance the giant magnetoresistive ratio ($\Delta R/R$). The oxygen-rich nickel oxide film is made using reactive sputtering of a nickel target in an oxygen-rich sputtering atmosphere consisting substantially of pure oxygen and argon gases. The total pressure of the oxygen-rich atmosphere is reduced during the oxygen-rich nickel oxide film formation to additionally enhance the $\Delta R/R$ value. A spin valve including two adjacent oxygen-rich nickel oxide underlayers provides a higher $\Delta R/R$ ratio at a given pinning strength H_{ua} than does a spin valve having only one oxygen-rich nickel oxide underlayer.